

DM7400 Quad 2-Input NAND Gates

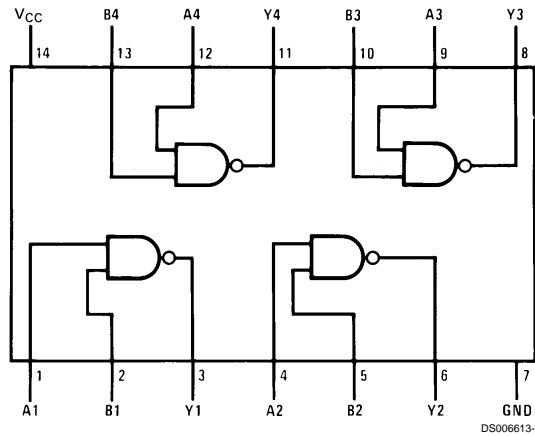
General Description

This device contains four independent gates each of which performs the logic NAND function.

Features

- Alternate Military/Aerospace device (5400) is available.
Contact a Fairchild Semiconductor Sales Office/Distributor for specifications.

Connection Diagram



Order Number 5400DMQB, 5400FMQB, DM5400J, DM5400W or DM7400N
See Package Number J14A, N14A or W14B

Function Table

$$Y = \overline{AB}$$

| Inputs | | Output |
|--------|---|--------|
| A | B | Y |
| L | L | H |
| L | H | H |
| H | L | H |
| H | H | L |

H = High Logic Level
L = Low Logic Level

Absolute Maximum Ratings (Note 1)

| | | | |
|--------------------------------------|------|---------------------------|-----------------|
| Supply Voltage | 7V | DM54 and 54 | -55°C to +125°C |
| Input Voltage | 5.5V | DM74 | 0°C to +70°C |
| Operating Free Air Temperature Range | | Storage Temperature Range | -65°C to +150°C |

Recommended Operating Conditions

| Symbol | Parameter | DM5400 | | | DM7400 | | | Units |
|-----------------|--------------------------------|--------|-----|------|--------|-----|------|-------|
| | | Min | Nom | Max | Min | Nom | Max | |
| V _{CC} | Supply Voltage | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| V _{IH} | High Level Input Voltage | 2 | | | 2 | | | V |
| V _{IL} | Low Level Input Voltage | | | 0.8 | | | 0.8 | V |
| I _{OH} | High Level Output Current | | | -0.4 | | | -0.4 | mA |
| I _{OL} | Low Level Output Current | | | 16 | | | 16 | mA |
| T _A | Free Air Operating Temperature | -55 | | 125 | 0 | | 70 | °C |

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Electrical Characteristics

over recommended operating free air temperature range (unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ (Note 2) | Max | Units | |
|------------------|-----------------------------------|---|------|-----------------|------|-------|----|
| V _I | Input Clamp Voltage | V _{CC} = Min, I _I = -12 mA | | | -1.5 | V | |
| V _{OH} | High Level Output Voltage | V _{CC} = Min, I _{OH} = Max V _{IL} = Max | 2.4 | 3.4 | | V | |
| V _{OL} | Low Level Output Voltage | V _{CC} = Min, I _{OL} = Max V _{IH} = Min | | 0.2 | 0.4 | V | |
| I _I | Input Current @ Max Input Voltage | V _{CC} = Max, V _I = 5.5V | | | 1 | mA | |
| I _{IH} | High Level Input Current | V _{CC} = Max, V _I = 2.4V | | | 40 | μA | |
| I _{IL} | Low Level Input Current | V _{CC} = Max, V _I = 0.4V | | | -1.6 | mA | |
| I _{OS} | Short Circuit Output Current | V _{CC} = Max | DM54 | -20 | | -55 | mA |
| | | (Note 3) | DM74 | -18 | | -55 | |
| I _{CCH} | Supply Current with Outputs High | V _{CC} = Max | | 4 | 8 | mA | |
| I _{CCL} | Supply Current with Outputs Low | V _{CC} = Max | | 12 | 22 | mA | |

Switching Characteristics

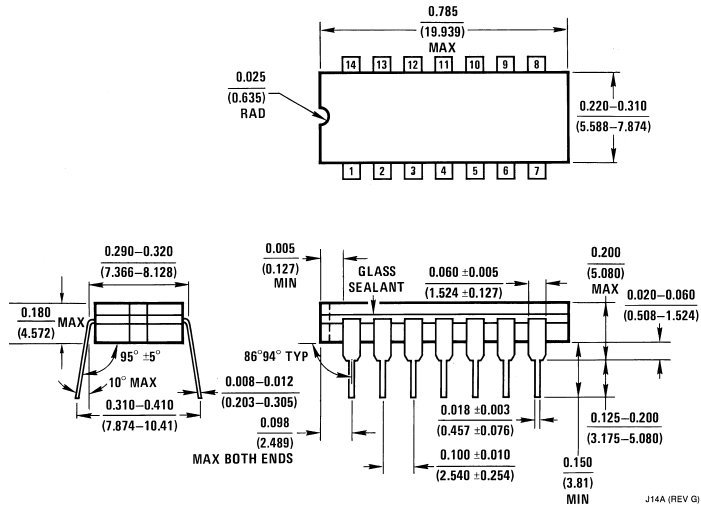
at V_{CC} = 5V and T_A = 25°C (See Section 1 for Test Waveforms and Output Load)

| Symbol | Parameter | Conditions | Min | Max | Units |
|------------------|--|---|-----|-----|-------|
| t _{PLH} | Propagation Delay Time Low to High Level Output | C _L = 15 pF R _L = 400Ω | | 22 | ns |
| t _{PHL} | Propagation Delay Time High to Low Level Output | | | 15 | ns |

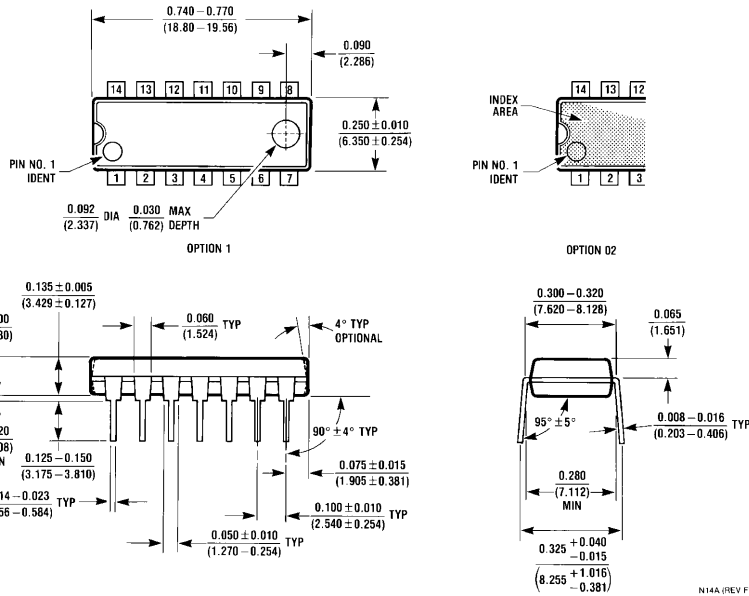
Note 2: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 3: Not more than one output should be shorted at a time.

Physical Dimensions inches (millimeters) unless otherwise noted

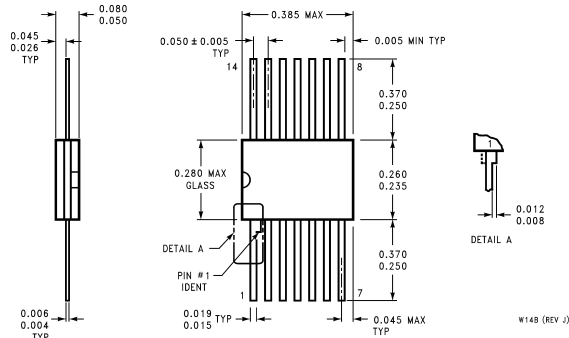


14-Lead Ceramic Dual-In-Line Package (J)
Order Number 5400DMQB or DM5400J
Package Number J14A



14-Lead Molded Dual-In-Line Package (N)
Order Number DM7400N
Package Number N14A

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



**14-Lead Ceramic Flat Package (W)
Order Number 5400FMQB or DM5400W
Package Number W14B**

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